GLAST Balloon Flight

Why a balloon flight?

What are we doing?

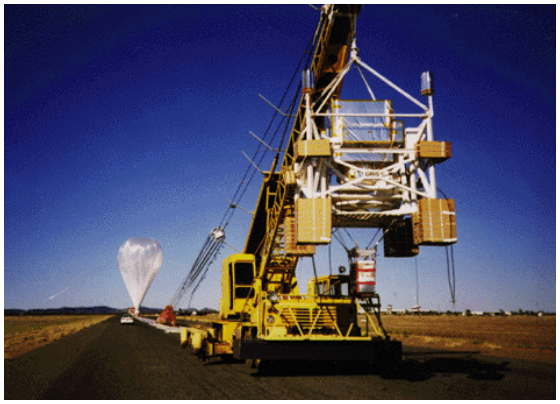
How are we doing it?

Why A Balloon Flight?

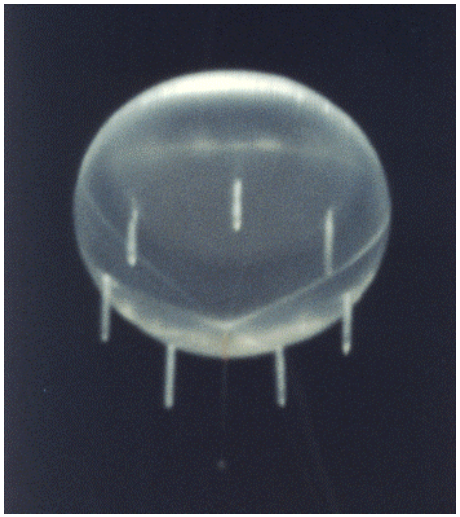
- "The LAT proposer must also demonstrate by a balloon flight of a representative model of the flight instrument or by some other effective means the ability of the proposed instrument to reject adequately the harsh background of a realistic space environment. … A software simulation is not deemed adequate for this purpose." **From the NASA AO**
- Background: a mixture of protons, heavier nuclei, electrons, photons; flux orders of magnitude greater than the flux of gamma rays; incident on all parts of the instrument from all directions, coming at random times

What Are We Doing?

- Build a Balloon Flight Engineering Model (BFEM) that can trigger, record data at kHz event rates, and measure live time.
- Construct a simulation of the BFEM that gives the effective area × solid angle as a function of energy.
- Develop a data analysis system capable of separating gamma-ray events from background.
- Obtain a successful balloon flight. There are risks.



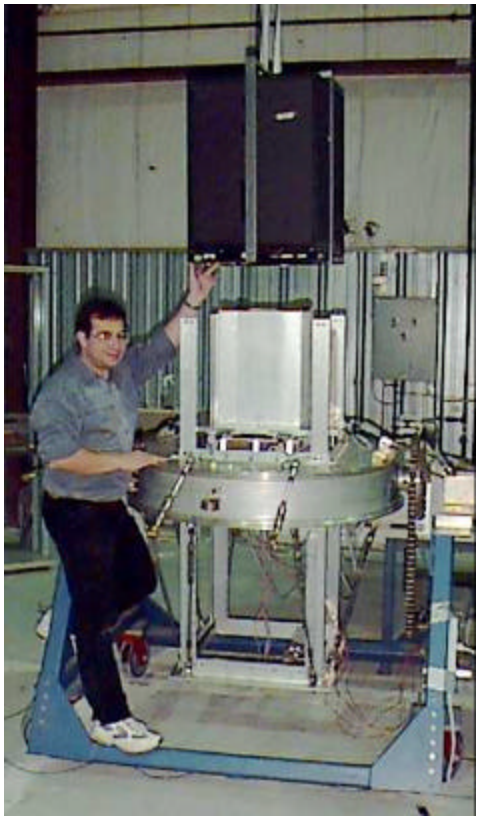
Balloon instrument ready to be launched.



A scientific balloon at a float altitude of 35 km. The balloon diameter is ~120m.

How are we doing it?

- Detectors are the ones used for our 1999 beam test.
- Gondola and housing are borrowed from balloon programs at Goddard.
- Data acquisition system is a modified version of the beam test system, with additions to record the data and handle the interfaces to the telemetry.
- Simulation and data analysis are based on the flight unit development.



The BFEM being assembled at SLAC.

Status and Schedule

- Instrument integration **Jan. - Feb**. at SLAC. Detectors, electronics, and power system are in place. Electrical integration is in progress.
- Simulations and data analysis system are under development. First full data test will be in **March**.
- Shipment to Goddard in March for integration into the gondola and full system testing during **April - May**.
- Shipment to National Scientific Balloon Facility at the end of May for a planned **June** flight.
- Preliminary analysis immediately following the flight, with a goal of presenting initial data at PDR in **August**.

Suborbital (Balloon) Flight Test Milestones

• Baseline Balloon Flight Plan	11/02/00
• Determine BFEM tracker configuration	11/07/00
• TKR, CAL, ACD delivery to SLAC	01/17/01
• External Gamma-ray Target (XGT) delivery	02/26/01
• Flight software release for testing	03/01/01
• Balloon Integration Unit (BIU) delivery	03/13/01
• Instrument integration complete, pre-ship review	03/14/01
• Arrive at GSFC	03/21/01
• Integration into gondola complete	04/04/01
• Testing complete, pre-ship review	05/14/01
• Arrive at National Scientific Balloon Facility	05/24/01
• Launch Readiness Review	06/20/01
• Balloon flight complete (Launch window 6/1-7/15)	06/25/01
• Preliminary report	08/23/01

WBS Organization